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ABSTRACT

The ability to anticipate elements in sequence is the foundation of all language skills. Because of its naturally high redundancy, it is almost always possible in the normal use of language to partially predict what will come next in a sequence of elements. The central feature of language processing is expectancy for successive elements. A very important question in second language instruction is determining how to teach students the skill of anticipating elements in sequence. This can best be done with materials in which meaningfulness is an element, syntactic structure is given a subordinate position, and the situational interaction of the people using the language is given prominence. (VM)

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EXPECTANCY FOR SUCCESSIVE ELEMENTS

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Language is an abbreviation for a much richer conceptualization. All that we know of objects, events, and relationships in our experience is not made explicit in our use of words and sentences, and indeed it cannot be. In order to communicate about our normal everyday thoughts and sensations, we are forced by intrinsic limitations to link together a string of abbreviations. When I say, for instance,

(1) My grandfather was a kind and tolerant man,

because you know the English language, this sentence has meaning for you. However, when I say the words "my grandfather" I have in mind a particular old gentleman with whom are associated fond memories of my childhood. It is inconceivable that you could have the same experiences in mind. You may of course have similar memories of your own grandfather or someone else whom you think of as an elderly, kind, and tolerant person, but one thing is nearly certain--the feelings, attitudes, and impressions that my sentence may cause you to have are as unique to you as mine are to me. It is almost paradoxical that we can have an intuitive understanding of our inability to completely understand what another person may wish to communicate to us or what we ourselves may want to express. Yet this is an undeniable evidence of the fact that speech is merely a partial manifestation of our private experience.

In spite of the fact, that whatever we do say leaves a great deal more unsaid, we are able to communicate amazingly well by means of language.

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As mature native speakers of English, or whatever language, we have acquired such remarkable skill, that not only do we usually understand one another, but we often do so in advance. In fact, in one sense, this is the rule rather than the exception. We are practically always a jump or two ahead of the person that we are listening to, and sometimes we even outrun our own tongues when we are speaking. It is not unusual for a speaker to say a word several syllables ahead of what he intended to say, nor is it uncommon for a listener to take a wrong turn in his thinking and to fail to understand correctly simply because he was expecting something else to be said.

It is my belief that our ability to anticipate elements in sequence is the foundation of all language skills. This capacity is by no means simple in its nature or its origin, but it certainly is all-pervasive. It begins in the prelanguage years, and continues to function throughout our lives in every aspect of our conscious existence. In an often quoted classic paper on serial order in behavior, Karl Lashley (1951) has said,

> . . . the organization of language seems to me to be characteristic of almost all other cerebral activity. There is a series of hierarchies of organization; the order of vocal movements in pronouncing the word, the order of words in the sentence, the order of sentences in the paragraph, the rational order of paragraphs in a discourse. Not only speech, but all skilled acts seem to involve the same problems of serial ordering, even down to the temporal coordinations of muscular contractions in such a movement as reaching and grasping (p. 187).

Because of the nature of human limitations, whether we are speaking of actions or ideas, in order for our minds to cope with the complexities inherent in our universe of experience it categorizes and systematizes elements into hierarchies and sequences. While the universe in which we exist is far more complex than we experience it to be at any given moment, the depths of our unconscious minds which have registered untold millions of details about previous experiences, are equally beyond the grasp of our present consciousness. What I am referring to here as "present consciousness" has been spoken of as "attention," "short-term memory," "conscious awareness," "primary memory," etc.

A simplified analogy, provided we remember it is a deliberate oversimplification, may be helpful in visualizing the basis of these concepts and their importance to the present discussion (cf. Figure 1). Our immediate awareness can be thought of as a point of interaction between external reality and the mind.

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Insert Figure 1 about here

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It is a corridor of activity where incoming elements of experience are processed to be stored in the memory system, and where the highly complex processes of thinking and language communication are effected. The whole of our cognitive experience may be compared to a more or less constant stream of complex and interrelated objects passing back and forth through this center of activity.

Because of the connections and relationships between incoming elements and since they tend to cluster together in predictable ways, we learn to expect certain kinds of things to follow from certain others.

When I turn the corner at Halbrent and Hatteras in Van Nuys, I expect to see a green and white house coming up on the left side of the street where I live. When someone speaks to you, you usually look in their direction expecting to seem them there. In fact, these examples are so common that we hesitate to even speak of them as expectations, yet imagine the shock and fear you would experience if a few of these common expectancies failed to continue to be correct. Think what it would be like to walk into your living room and find yourself in a strange building. Or imagine walking toward someone and getting farther from them with every step. The violations of our commonest expectations are horror-movie material that make earthquakes and hurricanes seem like Disneyland.

Among all our activities making use of expectancy for successive elements, the processes of language communication are undoubtedly the most complex and the most important to human existence. Language is the means par excellence for the organization of our experience. As Colin Cherry (1965) has said, we never feel we have fully grasped an idea until we have "jumped on it with both verbal feet." This process of putting an idea into words, or of comprehending an idea already put into words, involves the use of the grammar of a natural language which is, according to Ferré (1961), "a system of conventional signs incomparably more flexible, subtle, and complex than any other means of signification" (p. 148).

The founder of modern linguistics, Ferdinand de Saussure, has suggested that language as a system is organized within two basic dimensions: the paradigmatic, and the syntagmatic. I believe that these basic dimensions of language are also the major axes of cognition. ← The paradigmatic (or category dimension), which is relatively independent of time, may be thought of as a network of interrelated

categories, and hierarchies of categories, or paradigms. The traditional notion of a paradigm consisting of the various forms of a particular verb in a given tense is a special instance of the notion paradigm as I want to use it here. However, I want to think of paradigms or sets of objects in a much broader sense. In this more inclusive sense the eucalyptus trees at UCLA constitute a paradigm, as do foreign language teachers in general. Also, such ill-defined categories as transitive verbs and feelings are paradigms. In short, any notion however vague or abstract which encompasses a plurality of similar objects (whether the objects themselves are tangible and real or intangible and possibly non-existent) may be referred to as a paradigm. All of our cognitive experience is paradigmatically organized in that the objects of our perception and conception are members of paradigms.

The second dimension of cognitive organization which we must take into account is the syntagmatic axis. This is the dimension along which the elements of our experience fall into sequence. We may think of it as a time line extending from the past through the present to the future, along which our present consciousness travels.

Right now as I look out of my office window, a multiplicity of stimuli are available to my center of consciousness. There is the courtyard, the buildings and sky beyond, and there are the ideas that I am trying to express in words. As a reader, your present conscious experience is no less complex. You may see roughly similar surroundings from a considerably different perspective. You are actively involved in a process of communication to the extent that you are anticipating a great deal of what I have written. From time to time you may be exploring other ideas that come to mind, as a result of what you are reading or because of what

may be happening around you. Or perhaps you are thinking of examples which refute or support what I am saying. Whichever of the many possible thinking activities you are engaged in, your present consciousness is processing sequences and sub-sequences of elements.

By sacrificing progressively more and more detail, we may attend to larger and larger sequences of sub-sequences. We may narrow the focus of our attention in time or we may broaden it, much the way we may adjust the focus of our vision. I may think in terms of the sentence that I am now writing, or the broader context of the day on which I am writing it, or this school year, or my lifetime, or known history, etc. Regardless of how broad or narrow our perspective, however, there is a sequence of elements within it. The sequence itself may consist of relatively simple paradigmatic elements or of complex interrelated ones, but there must be a sequence because the totality of even a relatively simple aspect of our universe is too complex to be taken in at one gulp. We must deal with certain things ahead of others. In a sense, we must take in elements single file at a given rate, so that within the span of immediate consciousness, the number of elements being processed does not exceed certain limits.

In a characteristic masterpiece publication, George Miller (1956) has presented a considerable amount of evidence from a wide variety of sources suggesting that these limits are somewhere in the neighborhood of seven elements plus or minus two. He has also pointed out that we overcome them in part by what he calls "chunking." By treating sequences or clusters of elements as unitary chunks (or in our terminology, paradigms), we are enabled to function within a much richer cognitive system. Figure 2 illustrates in a very general and incomplete manner the way in which paradigmatic organization can function to enrich syntagmatic processing. Elements

at level 1 are grouped into chunks several units wide (Figure 2 uses seven as an estimate for chunk width), and the chunks themselves are treated as units of a higher level and grouped themselves into a sequence, and so on.

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Insert Figure 2 about here

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Natural language is perhaps the best example of this complex organization of elements into sequences of sequences of sequences, etc. Because of its naturally high redundancy, it is almost always possible in the normal use of language to partially predict what will come next in a sequence of elements. This is true no matter what level of language or mode of processing we are speaking of. The elements may be sounds, syllables, words, phrases, sentences, paragraphs, etc. The mode may be listening, speaking, reading, writing, or even thinking. Expectancy for successive elements functions in all cases.

Verbal processing experiments have shown that the more predictable a sequence of linguistic elements becomes, the more readily it is processed. (For a fuller discussion of the notion of predictability and its application in problems of second language learning, see "Difficulty and Predictability" UCLA TESL Workpapers, 1971.) For example, a sequence of nonsensical but pronounceable syllables like

(1) "nox ems glerf onmo kebs"

is more difficult than one like

(2) The nox ems have glerfed the onmo kebs,

which in turn is more difficult than

(3) The bad boys have chased the pretty girls.

It is easily observed that the gradation from nonsense to completely acceptable English can vary by much finer degrees than those represented here, but these examples serve to illustrate the fact that as a sequence of linguistic elements becomes increasingly predictable it becomes easier to handle. Not only is example (1) more difficult than (2) which in turn is more difficult than (3), but this order of relative difficulty holds true regardless of which of the traditionally recognized four skills we are speaking of. It is as though we were able to lie in wait for the next element in order to pounce on it and make short work of it--much shorter work at least than we might make if the element took us completely by surprise.

At this point, I suspect that some people will possibly object that I am merely substituting the term "predictability" for "grammaticalness" and am therefore not really saying much because the notion of predictability is not itself a clearly defined one. The issue might then seem to boil down to little more than a preference for one or the other term. This, I think, would be a reductio ad absurdum of an extremely important issue. The question is whether we want to think in terms of formal logical systems (as in many current conceptions of grammar) or of time/space dependent systems subject to dynamic fluctuation in constantly changing contexts. In spite of the fact that probability theory and models of information processing have not yet provided us with an entirely adequate definition of "predictability" the notion is obviously a useful one if we think in terms of the broad perspective of problems relating to language use and language learning.

An example or two may help to illustrate the problem I am getting at here. We cannot say <u>exactly</u> what is the probability of the sentence

(1) "My grandfather was a kind and tolerant man."

In fact, independent of context the question is not a meaningful one at all. However, we can easily agree that when asked the question,

(4) What time is it?

the sentence "My grandfather is a kind and tolerant man" is very improbable as an answer. However, if one were relating his autobiography, at certain points in such a context this sentence might be perfectly normal (i.e., quite probable).

Similarly, in the sentence

(5) The boy ran down the _____.

we cannot say what are the exact probabilities of the fillers "street," "hall," "plank," "dog," etc., but we can say that any of these is more likely to occur than one of the words "moon," "of," "clock," "said," etc. Moreover, this difference in relative probability has been shown to have clear effects on perception. The visual threshold for perceiving words has been shown to be significantly lower for items in a context than for those same items in isolation (Morton, 1964). And I would predict that items in isolation will have a lower threshold of perception than the same items in unlikely contexts, but this remains to be proved. The point is that we don't have to have an exact measure of an inexact property of language (namely, predictability) in order to be able to make good use of it.

Though they may not be entirely specifiable there are tremendously restrictive constraints on what may follow in a given sequence of linguistic elements. These constraints, we may add, go far beyond the traditionally recognized grammatical ones, and they operate in every aspect of our cognition. John Dewey (1910) in his treatise on thinking argues that the "central

factor in thinking" is an element of expectancy. He gives an example of a man strolling along on a warm day. Suddenly he notices that it has become cool. It occurs to him that it is probably going to rain; looking up, he sees a dark cloud between him and the sun, and he then quickens his steps (p. 6f). Dewey goes on to define thinking as "that operation in which present facts suggest other facts (or truths) in such a way as to induce belief in the latter upon the ground or warrant of the former" (p. 8f).

All of the preceding suggests a model of language behavior which is given a very simplified representation in Figure 3. The model contains

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Insert Figure 3 about here

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the implicit premise that the central feature of language processing is expectancy for successive elements. Some may question the lumping together of the four skills in this fashion on the basis that it fails to take account of the fact that a person can, for example, develop the ability to read and write a language without simultaneously having developed the capacity to think in the language, or to write or speak the language, or understand it when spoken. We once had a Japanese-speaking student at UCLA who wrote good compositions and had excellent reading comprehension in English, had translated Emily Dickenson into Japanese, but could not speak or understand simple instructions about how to get from the Humanities Building to the dorm. No doubt many teachers could cite similar cases. However, the problem in such cases is not one, I think, of central processing but of peripheral coding. This Japanese student simply had not yet learned to process the acoustical representation of English.

On the other side of the coin there is considerable empirical evidence in favor of the representation suggested in Figure 3. For one example, proficiency tests of non-native speakers of English indicate that about 80% of the variance in measures of reading, writing, speaking, and listening is completely overlapping. A dictation test may correlate as high as 90% with a test of reading comprehension, and with an oral interview. Unless there is something drastically wrong with the tests which we have investigated (Oller, in press; Oller and Redding, in press; Oller and Tullius, in press), there clearly must be some underlying commonality across skills.

Another possible objection to the notion that expectancy is the common element of language skills may arise when we consider the so-called productive component. There is, however, an important way in which an element of anticipation functions here. The speaker (or writer) anticipates what he will say (or write) next based on his intention to communicate, and he monitors what he actually hears himself saying (or sees his pen writing). It has been shown repeatedly that tampering with the speaker's own feedback of what he is saying has pronounced debilitating effects (Chase, Sutton, and First, 1959). The typical experiment of this type involves delayed auditory feedback or sidetone. The speakers voice is recorded on a tape and the recording is played back a fraction of a second later into a set of headphones which the speaker is wearing. This causes marked changes in the speaker's behavior. He will stutter and distort syllables almost beyond recognition. The problem is that he is trying to compensate for what he hears himself saying based on what he expects to hear.

A great deal more basic research remains to be done before we will begin to know all of the ins and outs or perhaps even the major facts

relating to our capacity to anticipate elements in contexts. If I have done nothing more than illustrate the utility of a study of this basic skill in relation to language behavior, I will feel that this paper has been successful. However, I would like to carry the discussion just a little further in order to relate it more concretely to the problems of teaching languages. I would like for a moment to consider the question: how can we teach students of a second language the skill of anticipating elements in sequence?

Before attempting to answer this question--which I believe is the central issue of language teaching--I want to digress a bit and consider one very popular method of approaching the task which I think is doomed to failure. In their introduction to a recent textbook entitled Modern English: A Textbook for Foreign Students (Rutherford, 1968), Stockwell and Bowen have stated,

> The most difficult transition in learning a language is going from mechanical skill in reproducing patterns acquired by repetition to the construction of novel but appropriate sentences in natural and social contexts. Language teachers . . . not infrequently fumble and despair when confronted with the challenge of leading students comfortably over this hurdle (oii).

Their comment is one, in my opinion, which illustrates a deep rooted error in modern theories of linguistics and derived theories of language learning.

The fact is that there is no such thing as "manipulative or mechanical skills," in the ordinary interpretation of these terms. If the authors meant mere pronunciation, this would be a different matter. They are, on the contrary,

reifying that will-o'-the-wisp called "grammar." The fact is that syntax does not exist in normal speakers of languages as a separate and independent skill, and there is no point in trying to teach it as such to language students.

The typical basis for foreign language teaching in our day is a set of materials organized primarily according to syntactic and, in the early stages, phonological criteria. The system can be pictured schematically as shown in Figure 4. Some simple syntactic patterns are selected from a

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Insert Figure 4 about here

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linguistic analysis of the language, and these are sometimes put together in an artificial dialogue or story. The various patterns are then developed into a sequence of pattern drills unrelated either to each other or to the story or dialogue in terms of meaning. As Haynes (1967) puts it,

> 'The man is here.' 'John looks sick.' 'Knute Rockne and George Gipp were about the same height.' . . . are the same sentences in terms of <u>la langue</u>, the code. This is why it matters little in pattern drilling whether the sentences which the student repeats in order to learn this rule, Subject/Verb, make any real sense, either in isolation or in sequence (p. 2).

While Stockwell and Bowen would probably shudder at Haynes' remark, I think it is a fair and logical extension of their fallacious distinction between "mechanical" versus communicative skill.

Let me here reiterate a plea for meaningfulness in language teaching from the beginning stages. This is an old cause dating at least to Otto

Jesperson in 1902. Yet it has received little more than lip-service from many theoreticians and practitioners in recent years. A better basis for organizing a set of materials is depicted in Figure 5. Here the syntactic

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Insert Figure 5 about here

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structure is given a subordinate position, and the situational interaction of the people using the language is given prominence. Drills are developed on a pragmatic basis, as situational paradigms, rather than syntactic paradigms. The focus is on meaning from beginning to end.

The learner knows about situations, it is how to code them in the target language that he needs to find out. By providing him with meaningful situations within which he can experience and interpret the new forms of the TL, we are taking full advantage of his previously acquired expectations--and where these are inapplicable, we are teaching him a new set.

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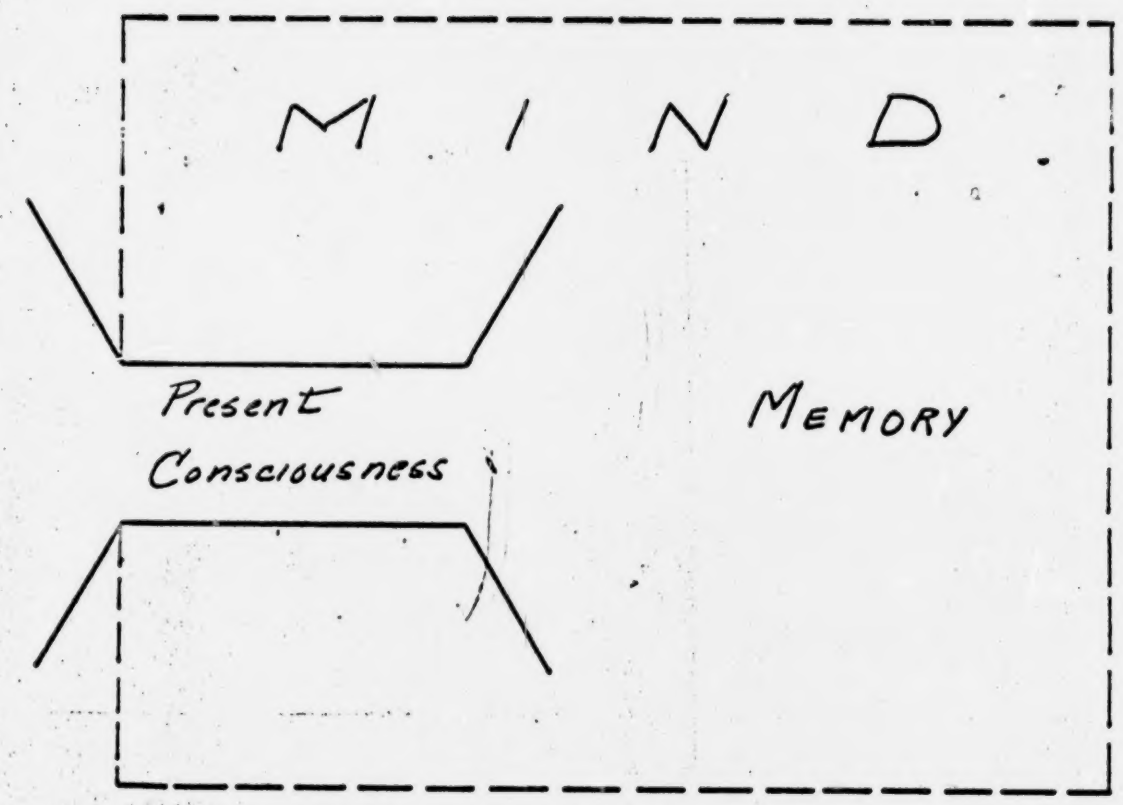

Figure 1. Simplified representation of present consciousness as the point of interaction between the external world and the human mind.

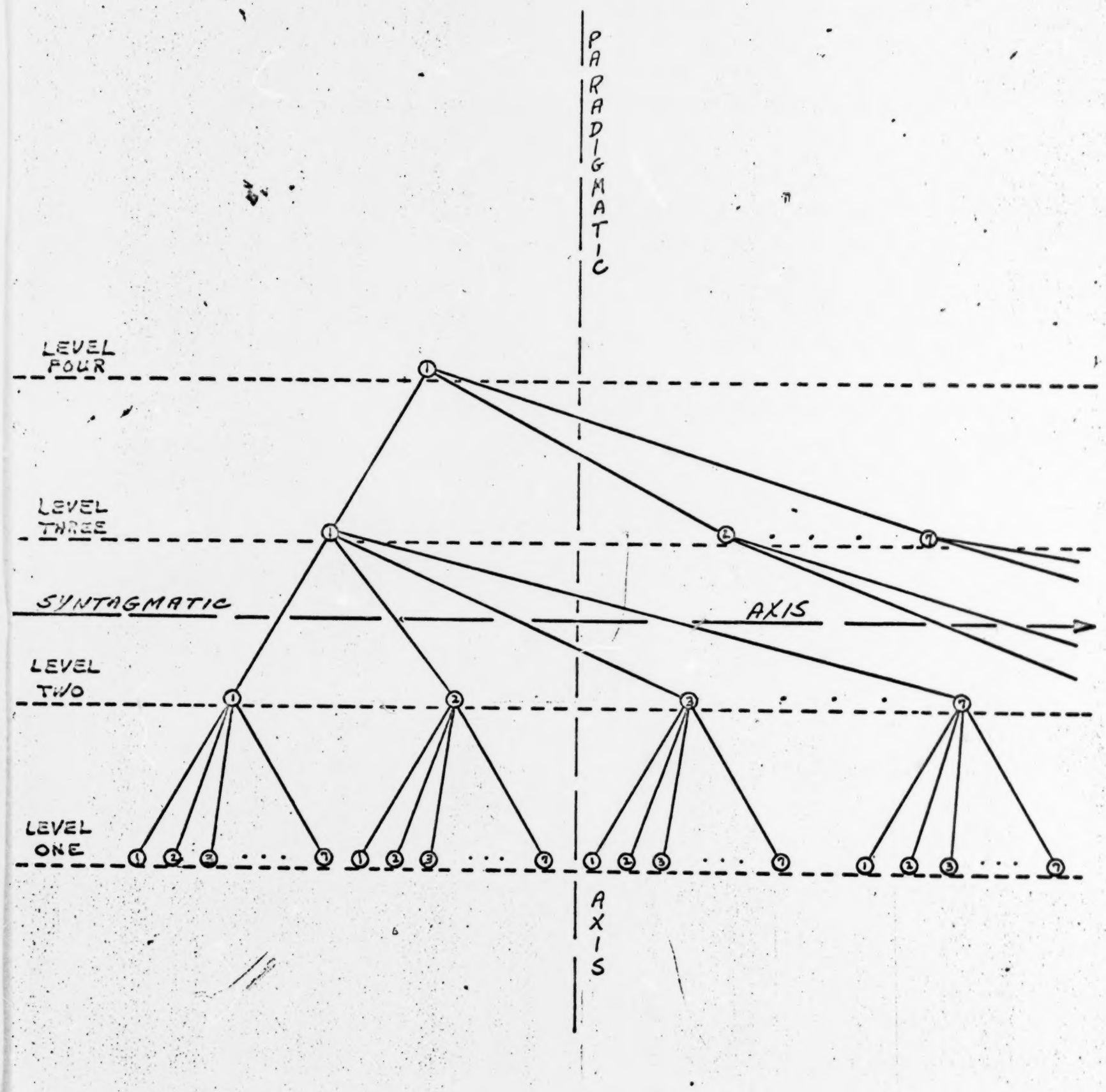

Figure 2. The organization of elements into sequences and hierarchies on the paradigmatic and syntagmatic axes.

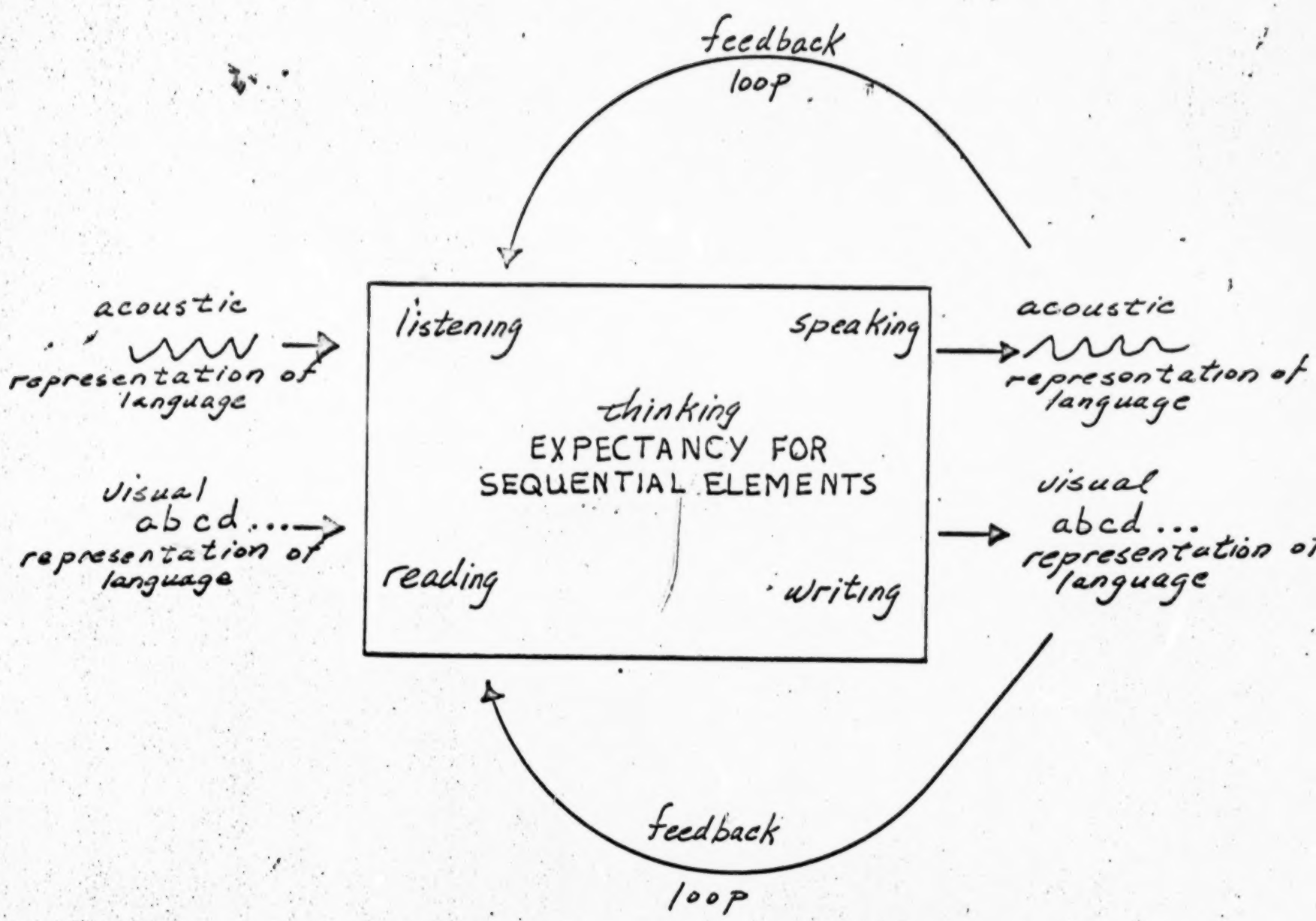

Figure 3. A simplified model of language skills.

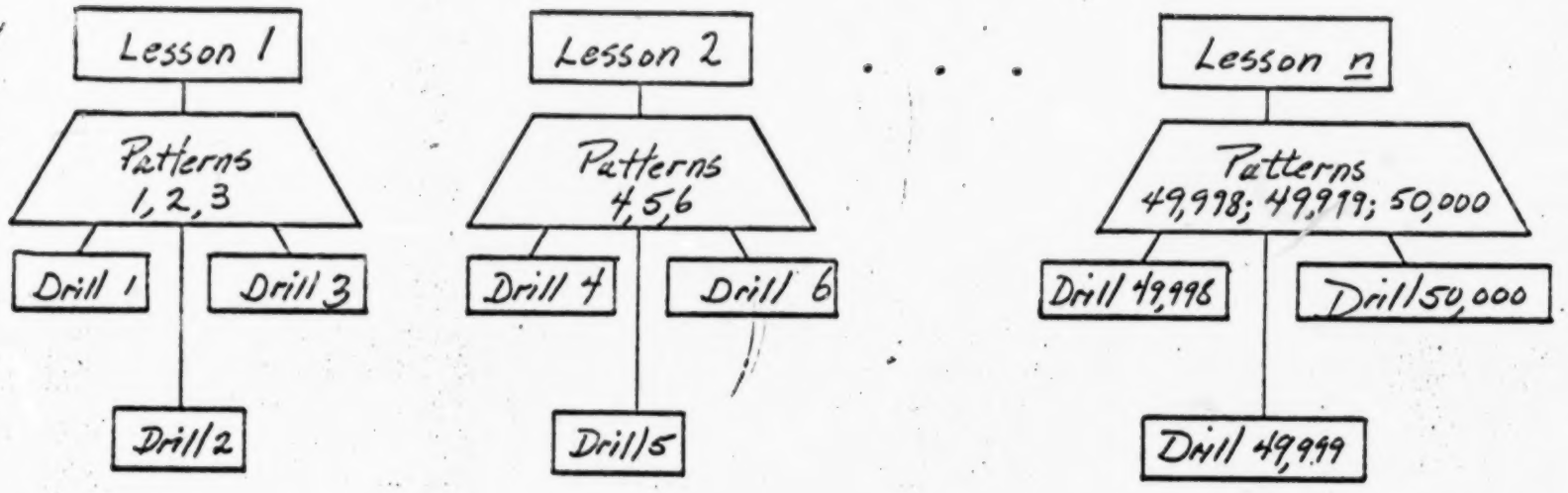

Figure 4. Organization of language materials on the basis of syntactic paradigms.

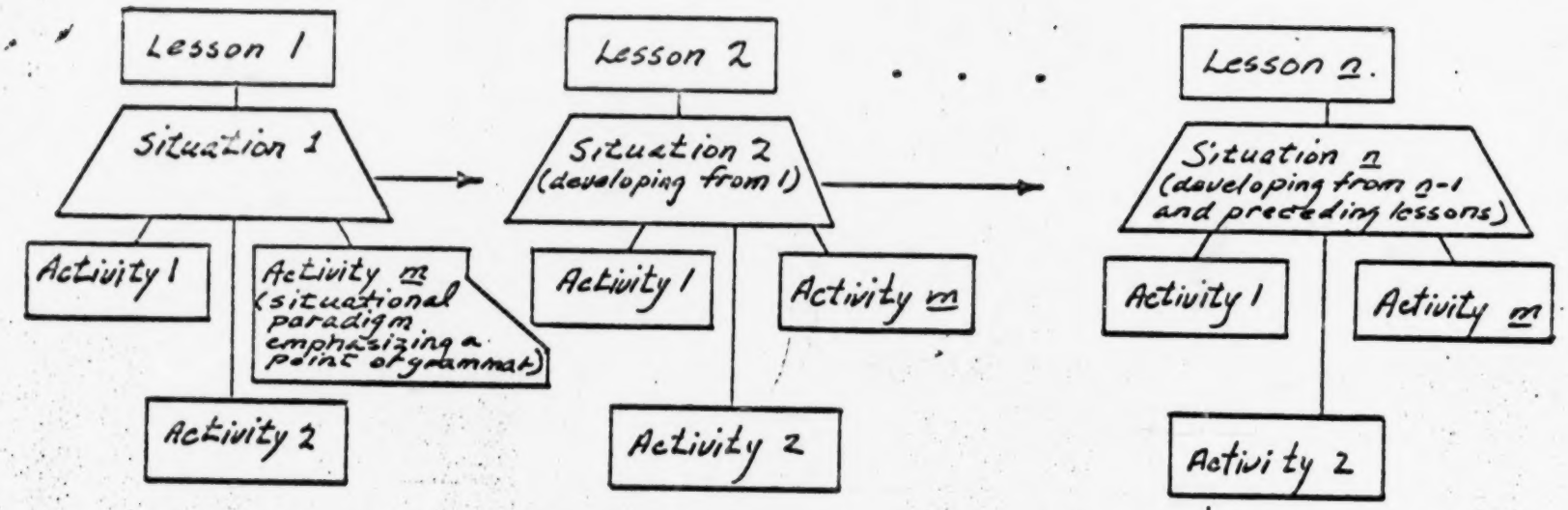

Figure 5. Organization of language materials on the basis of an ordered sequence of situational paradigms.